Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claim 1. (Currently Amended) A method of modeling or obtaining cardiac tissue or tissue-like structures comprising

(a) culturing ~~an~~ embryonic stem (ES) cell-derived differentiating or differentiated cardiomyocytes ~~first cell type~~ in the presence of differentiating or differentiated fibroblasts and differentiating or differentiated endothelial cells ~~at least one embryonic second cell type~~; and

(b) allowing integration and alignment of said differentiating or differentiated cardiomyocytes, fibroblasts and endothelial cells ~~at least two cell types~~ into cardiac tissue or tissue-like structures;

wherein said differentiating or differentiated cardiomyocytes acquire longitudinal morphology upon integration and alignment with fibroblasts and endothelial cells; and

wherein said cardiac tissue or tissue-like structures exhibit contractility and cross striation.

Claim 2. (Currently amended) The method of claim 1, wherein the ES cell of said ES cell-derived cardiomyocyte ~~first cell type~~ comprises a selectable marker operably linked to a ~~first cell type~~ cardiomyocyte-specific regulatory sequence specific for said cardiomyocyte ~~first cell type~~.

Claim 3. (Original) The method of claim 2, wherein said selectable marker confers resistance to puromycin.

Claim 4. (Currently Amended) The method of claim 1, wherein the ES cell of said ES cell-derived cardiomyocyte ~~first cell type~~ comprises a reporter gene operably linked to a ~~cell type~~ cardiomyocyte-specific regulatory sequence specific for said cardiomyocyte ~~first cell type~~.

Claim 5. (Currently amended) The method of claim 4, wherein said ~~cell type~~ cardiomyocyte-specific regulatory sequence of the reporter gene is substantially the same as said ~~first cell type~~ cardiomyocyte-specific regulatory sequence of the marker gene.

Claim 6. (Original) The method of claim 5, wherein said reporter is selected from different color versions of enhanced green fluorescent protein (EGFP).

Claim 7. (Previously presented) The method of claim 5, wherein said marker gene and said reporter gene are contained in the same recombinant nucleic acid molecule.

Claim 8. (Previously presented) The method of claim 7, wherein said marker gene and said reporter gene are contained in the same cistron.

Claims 9-10. Cancelled.

Claim 11. (Currently Amended) The method of claim 2 ~~claim 10~~, wherein said ~~first cell type~~ cardiomyocyte-specific regulatory sequence is atrial-specific, ventricular-specific, or both atrial and ventricular-specific.

Claims 12-14. Cancelled.

Claim 15. (Currently amended) A co-culture of cardiomyocytes, fibroblasts and endothelial cellsobtainable by culturing the cardiomyocytes, fibroblasts and endothelial cells of claim 1.

Claim 16. (Currently amended) A cardiac tissue obtainable by the method of claim 1.

Claims 17-25. Cancelled.

Claim 26. (Currently Amended) The method of claim 8 [[18]], wherein ~~said~~ the promoter is selected from the group consisting of αMHC, MLC2V, catherin, Tie-2 and collagen promoter.

Claims 27-39. Cancelled.

Claim 40. (Currently Amended) The method of ~~any one of claims~~ claim 1 ~~or 21~~, further comprising analyzing the physiological or developmental status or both of the cardiomyocytes, fibroblasts and endothelial cells ~~or cell aggregate~~.

Claim 41. (Currently Amended) The method of claim 40, wherein the status is analyzed by monitoring the differentiation of electrical activity of the cardiomyocytes, fibroblasts and endothelial cells on an array.

Claim 42. (Original) The method of claim 41, wherein said status is analyzed by recording the extracellular field potentials with a microelectrode array (MEA).

Claims 43-44. Cancelled.

Claim 45. (Currently Amended) A cardiac tissue obtainable by the method of ~~any one of claims~~ claim 1 ~~or 21~~.

Claims 46-48. Cancelled.

Claim 49. (Currently Amended) The method of ~~any one of claims~~ claim 1 ~~or 21~~ for analyzing early steps of tissue formation during embryonic development or the influence of factors and compounds on this process.

Claims 50-69. Cancelled.

Claim 70. (Currently Amended) The method of ~~any one of claims~~ claim 1 ~~or 21~~, wherein said one or more cells are genetically engineered to (over)express or inhibit the expression of a target gene.

Claim 71. (Currently Amended) The method of ~~any one of claims~~ claim 1 ~~or 21~~, wherein a compound known to activate or inhibit differentiation process or tissue structure formation or both is added to the culture medium.

Claim 72. (Currently Amended) The method of ~~any one of claims~~ claim 1 ~~or 21~~, wherein said one or more cells or cardiac tissue are contained in a container.

Claim 73. (Currently Amended) The method of claim 72 ~~any one of claims 1 or 21~~, comprising taking three or more measurements, optionally at different positions within the container.

Claim 74 (Currently Amended) The method of claim 72, wherein said container is a well in a microtiter plate.

Claim 75. (Original) The method of claim 74, wherein said microtiter plate is a 24-, 96-, 384- or 1586- well plate.

Claims 76-81. Cancelled.